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## Guidelines for day-case surgery 2019

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## Guidelines

# Guidelines for day-case surgery 2019

Guidelines from the Association of Anaesthetists and the British Association of Day Surgery

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## Summary

Guidelines are presented for the organisational and clinical management of anaesthesia for day-case surgery in adults and children. The advice presented is based on previously published recommendations, clinical studies and expert opinion.

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This is a consensus document produced by expert members of a working party established by the Association of Anaesthetists of Great Britain and Ireland and the British Association of Day Surgery (BADS). It has been seen and approved by the Association of Anaesthetist's Board of Directors and the Council of BADS. It has been endorsed by the Association of Paediatric Anaesthetists of Great Britain and Ireland (APAGBI) and the Royal College of Anaesthetists (RCOA).

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## What other guidelines are available on this topic?

Previous guidance was published by the Association of Anaesthetists in 2011 [1]. Guidance on day-case surgery has also been published by the RCoA [2].

## Why were these guidelines developed?

Since the previous guidelines were published, there have been a number of changes in day surgery, including an increase in the range of surgery performed and the patient casemix. With the development of enhanced recovery programmes, the short stay section of the previous guidelines has been excluded from this document.

## How and why does this statement differ from existing guidelines?

The previous Association of Anaesthetists guidance has been updated and input received from BADS, that includes surgeons and lay people, as well as the APAGBI.

## Recommendations

- 1 Thorough anaesthetist-led, nurse-delivered pre-anaesthetic assessment and preparation, as well as protocol-driven discharge, are fundamental to safe and effective day surgery
- 2 Fitness for a procedure should relate to the patient's functional status rather than ASA physical status
- 3 It is possible to undertake most surgery in adults and children as day cases
- 4 All day surgery units should have a clinical lead whose responsibilities include the development of local policies, guidelines and clinical governance
- 5 All anaesthetists should be familiar with techniques that permit the patient to undergo a procedure with minimum stress and maximum comfort in order to enable early discharge, including regional nerve blocks and neuraxial blockade, such as spinal anaesthesia
- 6 All members of the multidisciplinary team should be trained in day surgery practice
- 7 High-quality, age-appropriate advice leaflets, assessment forms and protocols for specific procedures should be in place
- 8 Day surgery should take place within a dedicated unit or area within the main hospital site
- 9 Quality assurance and improvement programmes are an essential component of good care in all aspects of day surgery

## Introduction

The definition of day surgery in Great Britain and Ireland is clear; the patient is admitted and discharged on the same day, with day surgery as the intended management. The term '23-h stay' should be avoided; this is used in the United States healthcare system, but in the UK is counted as inpatient care and should not be confused with day surgery.

Since the previous guideline was published in 2011 [1], the complexity of procedures continues to increase, with a wider range of patients now considered suitable for day surgery. Despite these advances, the overall rates of day surgery remain variable across the UK. The target that 75% of elective surgery should be performed as day cases remains in place [3], but minimally invasive surgery is now well established, allowing more procedures to be performed as day surgery and even greater rates should be possible [4]. There was a major effort to promote day surgery at the start of the millennium [5] and recent drives to reduce length of stay and improve the quality of postoperative recovery have ensured that day surgery principles are fundamental to modern patient care. Shortened hospital stay and earlier mobilisation also reduces the risk of hospital-acquired infections and venous thromboembolism [6].

## Recent reports

The NHS Modernisation Agency produced an operational guide detailing the facilities available in, and the management of, day surgery units [7]. This was refined in the 'Ten High Impact Changes' document in which the principle of treating day surgery as the default option for elective surgery was set out [5]. The NHS Institute for Innovation and Improvement has produced a document focusing on day case laparoscopic cholecystectomy [8]. Although this document is specific to one procedure, many aspects of the ideal patient pathway are equally applicable to a wide range of day surgery procedures.

Effective pre-anaesthetic assessment and preparation with protocol-driven nurse-led discharge are fundamental to safe and effective day surgery. Several publications provide useful advice on establishing and running a service [9–13].

The British Association of Day Surgery has produced a directory of procedures that provides targets for day surgery rates covering many different procedures [14]. These procedure-specific targets serve as a focus for clinicians and managers in the planning and provision of elective day surgery and illustrate the high quality of service achievable in appropriate circumstances.

In 2016, the Academy of Medical Royal Colleges produced a series of recommendations for clinicians and patients entitled 'Choosing Wisely' [15]. The top recommendation for clinicians was that day surgery should be considered the default for most surgical procedures. Variation in the use of day surgery for specific operations should be measured and this information made available to all interested parties. For patients, the following recommendation was given *'If you are having a surgical procedure, day surgery should be considered and is suitable in many cases. Day surgery allows for a quicker recovery with less disruption to you and your family life and also cuts the risk of hospital acquired infections. Evidence suggests that if day surgery was performed for 20 common procedures, an additional 186,000 patients could be treated each year without increased expenditure'*. This view was also supported by the King's Fund: *'The rising proportion of operations carried out as day cases over the past few decades has been good for patients and a much more efficient use of NHS resources'* [16].

## Selection of patients

Patients may be referred for day surgery from outpatient clinics, emergency departments or primary care. Advances in surgical and anaesthetic techniques, as well as published evidence of successful outcomes in patients with multiple comorbidities, have changed the emphasis on day surgery patient selection. It is now accepted that the majority of patients are appropriate for day surgery unless there is a valid reason why an overnight stay would be beneficial. If inpatient surgery is being considered it is important to question whether any strategies could be employed to enable the patient to be treated as a day case.

It is recommended that a multidisciplinary approach, with agreed protocols for patient assessment, including inclusion and exclusion criteria for day surgery, should be agreed locally between surgeons and the anaesthetic department. Patient assessment for day surgery falls into three main categories: social, medical and surgical.

### Social factors

The patient must understand the planned procedure and postoperative care and give informed consent to day surgery. Traditional criteria for day surgery discharge included the presence of a carer for 24 h postoperatively. This is now being re-evaluated [17] and it is recognised that for some minor procedures 24-h care postoperatively may be an excessive requirement, whereas for complex surgery it may be insufficient. For example, a patient who has undergone a hysterectomy as a day case is likely to require

care to support activities of daily living for longer than someone who has undergone a hysteroscopy. It is essential that, following procedures under general or regional anaesthesia, a responsible adult should escort the patient home; however, it may not always be essential for a carer to remain for the full 24-h period. Various models have been evaluated [18, 19], including a virtual ward system where patients are discharged without overnight home care but followed up by telephone for the first 24 h, placing carers into patients' homes overnight or discharging selected groups of patients home without overnight care.

### Medical factors

Fitness for a procedure should relate to the patient's functional status as determined at pre-anaesthetic assessment, and not by ASA physical status, age or body mass index [20–22]. Patients with a stable chronic disease such as diabetes are often better managed as day cases because there is minimal disruption to their daily routine [23]. The only patients routinely not included in day surgery are those with unstable medical conditions. In these circumstances, the question should be asked as to whether it is safe to go ahead with the procedure or whether it should be delayed until the patient's condition has been optimised. Once optimised, it may be appropriate to proceed as a day case. If surgery is required before the patient's condition can be optimised due to urgency (e.g. malignancy), then they may require inpatient admission.

Obesity itself is not a contraindication to day surgery, as morbidly obese patients can be safely managed by experts, provided appropriate resources are available. This includes factoring in additional time for anaesthesia and surgery as well as the presence of skilled assistants and equipment. The incidence of complications during the operation or in the early recovery phase is greater in patients with increasing body mass index. However, these problems would still occur with inpatient care and have usually resolved or been successfully treated by the time a day-case patient would be discharged. In addition, obese patients benefit from short-duration anaesthetic techniques and early mobilisation associated with day surgery [24, 25]. Prolonged deep vein thrombosis prophylaxis should be considered [26].

Obstructive sleep apnoea (OSA) is not an absolute contraindication to day surgery. Adults with a history of OSA or those identified at risk using 'STOP-Bang' scoring should be identified at pre-anaesthetic assessment. Avoidance of postoperative opioid medication in these patients is advised. The optimal technique, if possible, is regional anaesthesia. The Society for Ambulatory Anesthesia issued

a consensus statement on pre-operative selection of adult patients with OSA scheduled for ambulatory surgery: *'patients with a presumed diagnosis of OSA, based on screening tools such as the STOP-Bang questionnaire, and with optimised comorbid conditions can be considered for ambulatory surgery, if postoperative pain can be managed predominantly with non-opioid analgesic techniques'* [27]. Patients who use nasal CPAP (continuous positive airways pressure) at home should be encouraged to bring their devices into hospital with them and an individualised decision made as to whether it is appropriate for them to be discharged on the same day.

### **Surgical factors**

The procedure should not carry a significant risk of serious postoperative complications requiring immediate medical attention, for example, haemorrhage or cardiovascular instability. Postoperative symptoms (such as pain and nausea) must be controllable by the use of a combination of oral medication and local anaesthetic techniques.

The procedure should not prohibit the patient from resuming oral intake within a few hours of the end of surgery. Patients should be able to mobilise before discharge, for example, walking with an arm in plaster, but if full mobilisation is not possible, appropriate venous thromboembolism prophylaxis should be instituted and maintained.

### **Pre-operative preparation**

Pre-operative preparation has three essential components:

- 1 To educate patients and carers regarding day surgery pathways
- 2 To impart information regarding planned procedures and postoperative care to help patients make informed decisions; important information should be provided in writing
- 3 To identify medical risk factors, promote health and optimise the patient's condition

Preparation may be undertaken in a variety of settings. In order to achieve the three aims, best practice is for it to be undertaken by expert day surgery assessment staff within a self-contained day surgery facility. This allows patients and their relatives the opportunity to familiarise themselves with the environment and to meet staff who will provide their peri-operative care and who are well placed to educate the patient regarding the day surgery pathway [28]. However, other settings such as primary care or secure (general data protection regulation compliant) online

assessments may be appropriate for some patients. Whichever setting is used, the process should be carried out by a member of the multidisciplinary team trained in pre-anaesthetic assessment for day surgery. The process should follow a clear protocol, in agreement with the team providing anaesthesia, surgery and nursing care. It should identify any problems requiring management or optimisation before surgery and follow national or locally agreed guidelines.

Consultant-led and nurse-run clinics have proved very successful. One-stop clinics, where pre-anaesthetic preparation occurs on the same day as the decision for surgery, offer significant advantages to both patients (by avoiding an additional visit to hospital) and the hospital through ensuring that patients are prepared for surgery as early as possible in their care pathway, thereby allowing maximum time for optimisation, if required.

Screening questionnaires, in conjunction with agreed protocols, can offer guidance on appropriate pre-operative investigations. Although the National Institute for Health and Care Excellence (NICE) guidance on pre-operative investigations is widely used [29], one study showed no difference in the outcomes of day surgery patients when all pre-operative investigations were omitted [30]. However, screening for hypertension [31], anaemia [32] and an initial risk assessment for venous thromboembolism [26] should be undertaken in order to guide management according to local protocols.

Most patients can be assessed and prepared for surgery in nurse-run pre-anaesthetic clinics. Consultant anaesthetic pre-operative preparation clinics improve efficiency by enabling early review of the notes only in complex cases, ensuring appropriate investigations are performed and that patients are referred for a specialist opinion, if necessary.

### **Day surgery for urgent procedures**

Patients presenting with acute conditions requiring urgent surgery can be efficiently and effectively treated as day cases via a semi-elective pathway [33]. After initial assessment, many patients can be discharged home and return for surgery at an appropriate time, either on a day-case list or as a scheduled patient on an operating list, whereas others can be immediately transferred to the day surgery service. This reduces the likelihood of repeated postponement of surgery due to prioritisation of other cases. A robust day surgery process is key to the success of this service. Some of the procedures successfully managed in this manner are shown in Table 1 [34–36].

**Table 1** Types of urgent surgery suitable for day case procedures.

| General surgery                  | Gynaecology                                   | Trauma                    | Maxillofacial                |
|----------------------------------|---|---------------------------|------------------------------|
| Incision and drainage of abscess | Evacuation of retained products of conception | Tendon repair             | MUA fractured nose           |
| Laparoscopic cholecystectomy     | Laparoscopic ectopic pregnancy                | MUA of fracture           | Repair of fractured mandible |
| Laparoscopic appendicectomy      |   | Plating of fractured bone |                              |
| Temporal artery biopsy           |   |                           |                              |

MUA, manipulation under anaesthesia.

Essential components of an emergency day surgery pathway are:

- 1 Identification of appropriate procedures
- 2 Identification of a theatre list that can reliably accommodate the procedure (e.g. a dedicated day surgery list or a flexibly run emergency theatre list)
- 3 Ensuring clear pathways are in place
- 4 Determining whether the condition is safe to be left untreated for up to 24 h and manageable at home with oral analgesia
- 5 Providing clear pre-operative patient information, ideally in writing

## Documentation

Patients should be provided with general, as well as procedure-specific, information. This should be given in advance of admission in order to allow the patient time to absorb the information before their day-case surgery. Verbal comments should be reinforced with written material. Generic information should include practical details about attending the day surgery unit, whereas procedure-specific information should include clinical information about the patient's condition and the proposed surgical procedure. The anaesthetic information leaflets developed jointly between the Association of Anaesthetists and the RCoA are a useful resource [37].

Detailed documentation is important within the day surgery environment because the patient's experience is often condensed into a few hours. All aspects of treatment and care should be recorded accurately in order to ensure that each patient follows an effective and safe pathway. The documentation should be a continuum from pre-operative preparation to discharge and subsequent follow-up. Individual care plans and electronic patient records reflecting a multidisciplinary approach are favoured in many units. Variations for specific groups, including children and patients undergoing procedures under local anaesthesia, should be available. Procedure-specific care plans reflecting integrated care pathways

may be used for more complex and challenging cases [38]. Care plans are also useful for quality assurance and evaluating outcomes.

## Management and staffing

All day surgery units should have a clinical lead with a specific interest in day surgery whose responsibilities include the development of local policies, guidelines and clinical governance. A consultant anaesthetist with management experience is ideally suited to such a role, and job plans should reflect this responsibility [4]. Day surgery should ideally be represented at Board level [5] and issues that arise should be escalated to senior management where necessary.

The clinical lead should be supported by a day surgery unit manager who has responsibility for the day-to-day running of the service. The manager will often have a nursing background and should have the knowledge and skills in order to make informed decisions and lead on all aspects of day surgery development.

Nurses, anaesthetic assistants and other ancillary staff levels will depend on the design of the facility, case mix, work-load, local preferences and the individual unit's ability to conform to national guidelines. Staff should be specifically trained in day surgery care. Many units favour multiskilled staff who have the knowledge and ability to work within several different areas of the day surgery unit. Efficient use of resources is best achieved by a well-trained, flexible and multiskilled workforce [39].

Extended roles facilitate job satisfaction and encourage personal development and staff retention. Many healthcare assistants in the day surgery unit are now, under supervision, able to perform duties traditionally only undertaken by qualified nurses [40, 41]. Individual units should formulate a staffing structure that takes into consideration local needs.

Each unit should have a multidisciplinary operational group that oversees the day-to-day running of the unit, agrees policies and timetables, reviews operational issues and organises quality assurance strategies.



## Facilities

Day surgery works best when it is provided in a self-contained unit that is functionally and structurally separate from inpatient wards and operating theatres. It should have its own reception, consulting rooms, ward, theatres and recovery area, together with administrative facilities. Typical day surgery unit opening hours are 07:00–20:00 h Monday to Friday, but with the increasing complexity of surgery many units now open until 22:00 h. Some units provide a 6- or 7-day service.

The operating theatre and first-stage recovery areas should be equipped and staffed to the same standards as an inpatient facility, with the exception of the use of trolleys rather than beds. Several patients per day can occupy the same trolley space, providing a streamlined turnaround time. The day surgery unit should have no capacity to accept overnight admissions. Clear agreements should be in place to ensure it is not used for emergency inpatient care. Units which have introduced overnight beds into their day unit have found they are regularly occupied by emergency patients, resulting in the disruption of the following day's activity, reduced standards of care and staff demoralisation [42]. The introduction of short stay beds for elective surgery into a day surgery unit can also jeopardise outcomes for day surgery patients by making it relatively easy for a patient to be admitted to one of these beds overnight, hence the drive to facilitate same day discharge may be compromised. Car parking or short stay drop-off and pick-up areas should be provided adjacent to the unit.

An alternative to a purpose-built unit is the use of a day-case ward, with patients transferred to the main operating theatre. This model may allow a more straightforward change when transitioning from day case to overnight stay for complex procedures, as there is little impact on theatre equipment or staffing. However, day case beds dispersed around many wards do not achieve the same efficiencies, nor do they provide the targeted service that is required to achieve good outcomes.

Many hospitals provide care for day surgery patients who require anaesthesia in specialised units, for example, ophthalmology or dentistry. It may not be possible or appropriate to centralise these services; however, all such patients should receive the same high standards of selection, preparation, peri-operative care, discharge and follow-up as those attending dedicated day surgery facilities.

Facilities should ensure the maintenance of a patient's privacy and dignity at all times. Side rooms are particularly useful when caring for patients requiring an increased level of sensitivity, such as those with special needs.

## Admission process

Patients should be admitted to the day surgery unit as close as possible to the time of their surgery. Full staggering of patient admission times may result in inefficient processes due to the need for medical staff to review patients pre-operatively, but grouping patients into two morning and two afternoon admission times, such as 07:00 h, 10:00 h, 12:00 h and 15:00 h enables theatre lists to run smoothly while minimising delays and disruption for patients. Ideally a second anaesthetist should be provided in order to support two or three lists and enable the anaesthetist allocated to each list to see patients as they are admitted.

Fasting times should be kept to a minimum. Recent European guidelines on peri-operative fasting (endorsed by the Association of Anaesthetists) [43] state that adults should be encouraged to drink clear fluids up to 2 h before elective surgery and all but one member of the guidelines group considered that tea or coffee with milk added (up to about one-fifth of the total volume) are still considered clear fluids. Solid food should be prohibited for 6 h before elective surgery in adults and children, although surgery should not necessarily be cancelled or delayed just because they are chewing gum, sucking a boiled sweet or smoking immediately before induction of anaesthesia.

Pre-operatively, patients should be allowed to stay in their 'street clothes' for as long as possible in order to maintain dignity, warmth and comfort. At a suitable time, they should change into theatre gowns and wait in a single sex area. They should walk to theatre and ideally transfer themselves onto the operating trolley in the anaesthetic room. They can remain on this trolley throughout their day surgery pathway until ready for transfer to a chair in the postoperative ward.

## Anaesthetic management

Day surgery anaesthesia should be a consultant-led service. However, as day surgery becomes the norm for elective surgery, consideration should be given to the education of trainees as recommended by the RCoA. This requires appropriate training and provision of senior cover, especially in stand-alone units. Staff grade and associate specialist anaesthetists who have an interest in day surgery should be encouraged to develop this as a specialist interest and take an important role in the management of the unit.

National guidelines for patient monitoring and assistance for the anaesthetist should be followed [44, 45]. Anaesthetic techniques should ensure minimum stress and maximum comfort for the patient and should take into

consideration the risks and benefits of the individual technique. Analgesia is paramount and must be long acting, but, as morbidity such as nausea and vomiting must be minimised, the indiscriminate use of opioids is discouraged (particularly morphine). Prophylactic oral analgesia with long-acting non-steroidal anti-inflammatory drugs (NSAIDs) should be given to all patients, unless contraindicated. For certain procedures (e.g. laparoscopic cholecystectomy), there is evidence that standardised anaesthetic protocols or techniques improve outcome [8]. Anaesthetists should adhere to such clinical guidelines where they exist.

Although early mobilisation is beneficial, extending the range and complexity of day surgery procedures may increase the risk of venous thromboembolism. National guidelines for venous thromboembolism risk assessment and prophylaxis should be followed. There should be policies for the management of postoperative nausea and vomiting (PONV) and discharge analgesia. Prophylactic anti-emetics are recommended in patients with a history of PONV, motion sickness and those undergoing certain procedures such as laparoscopic sterilisation/cholecystectomy or tonsillectomy. Routine use of intravenous (i.v.) fluids and maintenance of body temperature can enhance the patient's feeling of well-being and further reduce PONV [46].

### **Regional anaesthesia**

Local infiltration and nerve blocks can provide excellent anaesthesia and pain relief after day surgery. Patients may safely be discharged home with residual motor or sensory blockade, provided the limb is protected and appropriate support is available for the patient at home. The expected duration of the blockade should be explained and the patient should receive written instructions as to their conduct until normal power and sensation return. Infusions of local anaesthetics may also have a role [47, 48]. The use of ultrasound guidance continues to expand the role of regional anaesthesia in day surgery, enabling more accurate local anaesthetic placement, reducing the total dose administered and supporting the development of regional anaesthetic operating lists. Use of a 'block room' improves efficiency and allows confirmation of adequate nerve blockade before surgery commences.

Spinal anaesthesia has become accepted for use in day surgery with the introduction of low-dose local anaesthetic techniques and newer shorter acting local anaesthetics such as hyperbaric prilocaine 2% and 2-chloroprocaine [49]. Appropriate spinal anaesthetic dosing targeted to surgical site, for example, lateral for a unilateral knee arthroscopy or sitting for peri-anal procedures, can minimise side-effects such as hypotension and prolonged

motor blockade. Restricting i.v. fluids to no more than 500 ml should reduce the incidence of urinary retention. Patients should be encouraged to drink postoperatively in order to allow their own body to correct fluid balance. Concerns regarding post-dural puncture headache have previously limited the use of spinal anaesthesia in day surgery patients, but the use of smaller gauge (25 G) and pencil-point needles has reduced the incidence to < 1%. Information on post-dural puncture headache and what to do if this occurs should be included in the patient's discharge instructions. An analgesic plan for patients having spinal or regional anaesthesia is required, otherwise the patient may experience significant pain when the block wears off [50]. This should include, unless contraindicated, premedication with oral analgesics, in addition to postoperative oral analgesics with written instructions regarding when to take them. Sedation is seldom required and, in arthroscopic procedures for example, the patient may wish to observe the procedure and the surgeon can explain the findings at the time.

Nursing staff should follow strict criteria to enable safe mobilisation after spinal anaesthesia. These include return of sensation to the peri-anal area (S4–5), plantar flexion of the foot at pre-operative levels of strength and return of proprioception in the big toe. This may be affected by any supplementary local anaesthetic infiltration or regional anaesthesia used to provide longer acting anaesthesia at the operative site. Further information on the use of spinal anaesthesia in day surgery and examples of patient information leaflets can be found on the BADS website ([www.bads.co.uk](http://www.bads.co.uk)).

### **Postoperative recovery and discharge**

Recovery from anaesthesia and surgery can be divided into three phases:

First-stage recovery lasts until the patient is awake, protective airway reflexes have returned and pain is controlled. This should be undertaken in a recovery area with appropriate facilities and staffing [39]. Use of modern drugs and techniques may allow early recovery to be complete by the time the patient leaves the operating theatre, and some patients can bypass the first stage. Most patients who undergo surgery with a local or regional anaesthetic block can be fast-tracked in this manner.

Second-stage recovery is from when the patient steps off the trolley and ends when the patient is ready for discharge from hospital. This should take place in an area adjacent to the day surgery theatre and should be equipped and staffed to deal with common postoperative problems (e.g. PONV, pain) as well as emergencies (haemorrhage,



cardiovascular events). The anaesthetist and surgeon should be contactable to deal with problems. Nurse-led discharge using agreed protocols should be the standard pathway. Voiding is also not always required, although it is important to identify patients who are at particular risk of developing later problems, such as those who have experienced prolonged instrumentation or manipulation of the bladder. Protocols may be adapted to allow low-risk patients to be discharged without fulfilling traditional criteria. Mild postoperative confusion in the elderly after surgery is common. This is usually insignificant and should not influence discharge provided social circumstances permit; in fact, the avoidance of hospitalisation after minor surgery is preferred [51]. Patients and their carers should be provided with written information that includes warning signs of possible complications and when to seek help. Protocols should exist for the management of patients who require unscheduled admission, especially in a stand-alone unit.

Late recovery ends when the patient has made a full physiological and psychological recovery from the procedure. This may take several weeks or months and is beyond the scope of these guidelines.

### **Postoperative instructions and discharge**

On discharge, all patients should receive verbal and written instructions and be warned of any symptoms that might be experienced. Wherever possible, these instructions should be given in the presence of the responsible person who is to escort the patient home.

Advice should be given not to drink alcohol, operate machinery or drive for 24 h after a general anaesthetic [52]. More importantly, patients should not drive until the pain or immobility from their operation allows them to control their car safely and perform an emergency stop. Procedure-specific recommendations regarding driving should be made available. Recent guidance for driving following isoflurane anaesthesia recommends refraining from driving for four days after its use. This would suggest that longer acting agents such as isoflurane may be best avoided within day surgery, reinforcing the guidance that careful selection of short-acting agents which are free from sedative side-effects and hangover are key to the delivery of high-quality day surgery anaesthetic outcomes. Driving restrictions regarding opioid-based medications state that patients can drive after taking these drugs only if they have been prescribed them by a healthcare professional, they do not cause them to be unfit to drive and they follow the advice given on how to take them [53].

All patients should be discharged with instructions as to appropriate analgesia usage. Patients can be encouraged to purchase over the counter analgesics in order to reduce costs, although some units will provide pre-packaged take-home medications as they are convenient and prevent delays and unnecessary visits to the hospital pharmacy. Analgesic protocols (Appendix 1 and 2) specific to day surgery can be agreed with the pharmacy department.

### **Discharge summary**

It is essential to inform the patient's general practitioner promptly of the type of anaesthetic given, the surgical procedure performed and the postoperative instructions given. Patients should be given a copy of their discharge summary in order to have it available should they require medical assistance.

Day surgery units should agree with their local primary care teams how support is to be provided for patients in the event of postoperative complications. Best practice is a helpline for at least the first 24 h after discharge, and to arrange telephone follow-up the next day. Such follow-up is highly valued by patients, provides support should any immediate complications arise, and is useful for auditing postoperative symptoms, patient satisfaction and other quality assurance issues.

## **Day surgery for children**

Day surgery is optimal for most children and standards of care are described in the '*Guidelines for the Provision of Paediatric Anaesthesia Services 2017*', Chapter 10 [54]. Many children require day-stay anaesthesia for non-surgical procedures such as imaging, endoscopy, laser treatment to skin lesions, radiotherapy and oncology investigations and treatments. These children should have the same standards of care as those having surgical procedures.

Wherever possible, children should be managed on dedicated lists separate from adults, or prioritised as a cohort to have their procedures at the start of the list and separated from adults in the recovery area and on the ward. Teenagers and young people have specific psychosocial and emotional needs, and consideration needs to be given as to where care is best provided for each individual.

### **Patient selection**

All hospitals should have guidelines on the lower age limit and medical comorbidities of children they will accept for day surgery. This should reflect the available facilities and equipment, as well as the training and experience of their staff.

District General Hospitals deliver day surgery for a large number of children and can provide a high-quality service close to home for otherwise healthy children having simple procedures. Day surgery in a local hospital is also possible for children with chronic stable disease provided the necessary expertise, infrastructure and support are in place. The BADS directory of procedures [14] includes a list of paediatric procedures although, as in adults, the range of procedures performed as day cases is constantly evolving. There are few absolute contraindications to day surgery in children [55].

Tertiary paediatric centres are performing increasingly complex procedures as day cases. Most children, even those with complex comorbidities, can have safe day care if pre-operative assessment is robust and care is individualised and delivered by experienced staff in appropriate facilities. Many tertiary centres adopt a lower age limit of 44 weeks 'post-menstrual age' (defined as gestational age plus chronological age) for minor procedures in otherwise well, term, neonates. Ex-premature infants (those born at less than 37 weeks gestational age) are a complex heterogeneous group requiring careful individual assessment, and are not usually accepted for day surgery < 60 weeks postmenstrual age.

Children with OSA presenting for tonsillectomy/adenoidectomy also need careful assessment. A consensus statement [56] advises which children are suitable for District General Hospital care. Children with severe OSA should usually be managed in a tertiary centre and are not suitable for day surgery due to the high risk of postoperative complications [57].

The home environment, distance from the hospital, parents' (parent here and throughout this section refers to parent, guardian or carer) access to transport and a telephone, need to be considered. Parents must be able to understand instructions, recognise complications that would require a return to hospital (e.g. post-tonsillectomy bleeding) and have a supply of suitable analgesics in order to manage their child's pain at home.

### **Pre-operative assessment**

Most children are healthy and pre-operative assessment is less about medical screening and more about preparation of the child and family for the procedure on the day and care at home after discharge. However, for some children, there are important medical issues which require careful consideration and pre-operative investigations such as haemoglobin levels and sickledex tests.

Robust pre-operative assessment minimises cancellations on the day and delivers clear information for

children and parents. It is also an opportunity to identify the particularly anxious child and to develop a plan for the day of surgery. Play specialists and experienced nurses can help with psychological preparation and hence avoid distress in the anaesthetic room and refusal on the day.

Parents can be signposted to sources of information which include leaflets and, in many cases, hospital-specific web-based information. Up-to-date sources of information for parents and children can be found on the RCoA and APAGBI websites ([www.rcoa.ac.uk](http://www.rcoa.ac.uk), [www.apagbi.org.uk](http://www.apagbi.org.uk)). These include '*Your Child's General Anaesthetic*', for parents, and a range of age-appropriate information for children and young people. Parents need to know who to contact if their child becomes unwell before the day of surgery. This can prevent late cancellations, avoiding the waste of theatre resources and unnecessary trips to hospital with a child who is not fit for the procedure and may be an infection risk.

Pre-anaesthetic assessment is also an opportunity to establish who has parental responsibility and to ensure that appropriate consent procedures are followed. Written consent for the procedure may already have been obtained in the outpatient setting, but a discussion regarding anaesthesia should also take place with the parent. The pre-operative visit is a good opportunity to discuss common complications and side-effects of anaesthesia. Different issues need to be emphasised according to the age of the child. For babies and young children, there is likely to be a discussion regarding the options for gaseous or i.v. induction and which is most suitable for their child. There should be an explanation of what to expect in the anaesthetic room, and how parents can best support their child. Parental concerns about risks of anaesthesia in the young child should be addressed [58].

Teenagers often have particular concerns related to loss of control, awareness or not waking up, and may not readily voice these anxieties. Venous thrombo embolism prophylaxis should be considered [59]. For female patients aged 12 and older, pregnancy status should be ascertained on the day of surgery, and departments should have a policy for pregnancy testing and documentation in line with the Royal College of Paediatrics and Child Health 2012 guidance for clinicians [60].

Emergence delirium is more common in young children after short procedures, is distressing for parents and staff, and impairs the quality of recovery. Anaesthetic techniques should be modified to minimise the risk of emergence delirium in susceptible children in order to facilitate smooth recovery and discharge [61, 62].

Although most children recover quickly from anaesthesia, delivery of a high-quality service requires careful planning and the employment of specific strategies. For example, many centres are introducing policies to reduce prolonged fasting. A consensus statement has been published from the APAGBI, the European Society for Paediatric Anaesthesiology and L'Association Des Anesthésistes-Reanimateurs Pédiatriques d'Expression Française on updated fluid fasting guidelines for children before elective general anaesthesia. These include adopting a 1-h rule for clear fluids and encouraging children to drink until shortly before surgery [63]. Techniques to minimise the incidence of PONV, particularly for high-risk surgery such as squint and tonsillectomy procedures, should be employed. These include considering the necessity for, and dosing of, opioids, as well as the choice of specific anti-emetics which are suitable and effective in children [64]. With the increase in day surgery, much of the responsibility for postoperative pain management falls to the parent, although some may not feel well informed or confident enough to manage their child's pain. Although pain after many day case procedures is easily managed, there are a number of common procedures, including tonsillectomy and orchidopexy, which can cause significant pain for up to 2 weeks postoperatively. Parents need clear verbal and written advice about pain assessment and management as well as easy access to telephone support. Initial advice should be given at pre-anaesthetic assessment, with further specific information on the day of surgery. The importance of appropriate dosage regimens (based on age and weight) and different analgesics such as paracetamol, NSAIDs and, where appropriate, oral opioids, should be emphasised to parents, so that they are confident in managing their child's pain at home.

## Quality improvement

Effective audit is an essential component of assessing, monitoring and maintaining the efficiency and quality of patient care in day surgery units. There should be routine collection of data regarding patient throughput and outcomes. There have been a variety of tools developed to determine patient outcomes. The most successful units collect data electronically at all stages of the day surgery process. The RCoA's compendium of audit recipes devotes a section to possible audits relevant to day surgery [65]. A good example of a national audit was completed by APAGBI in November 2017 [66].

Audit of day surgery services relate primarily to quality of care and efficiency. Examples of day surgery processes amenable to audit that have measurable outcomes are

shown in Table 2. A robust database is helpful; however, the best databases fail to effect change unless the information is clearly displayed and freely disseminated to everyone, particularly key individuals empowered to influence change.

## Older patients

Older patients are increasingly being listed for day-case surgery. Patients with advanced chronological age can safely be operated on in the day surgery environment. It is increasingly appreciated that admission to hospital for elderly patients can trigger confusion resulting from disorientation and disruption of their usual routine. Day surgery is hence usually the optimal pathway for these patients and is associated with no increase in adverse outcomes when compared with the younger population. However, it must be remembered that older patients are less likely to admit to feeling unwell, uncomfortable or distressed. They are often already partially dehydrated even before the period of fasting required before surgery and may be prone to hypoglycaemia. The multidisciplinary team should be aware of the needs and behaviours of older patients in order to provide appropriate care, achieve positive outcomes and reduce the risk of overnight admission.

## Teaching and training

It is essential that training is provided in day-case anaesthesia. It is a core module in all three stages of anaesthetic training – basic [67], intermediate [68] and higher [69] – and can be selected as an advanced training module [70] with the expectation that the trainee demonstrates maturation during each level of progression. The RCoA recommends that training in day surgery is delivered as part of core general duties and not only involves learning appropriate anaesthetic techniques, but encompasses the entire day surgery process. This should include: teaching on patient selection; effective analgesic regimens; PONV; requirements for safe discharge; and the management of patients following discharge. There should also be emphasis on educating trainees about the necessity for providing a multidisciplinary service for day-case surgery. For advanced training, the greatest benefit will be gained from developing the trainees' management and leadership skills in relation to the organisation of a day surgery unit.

It is important to remember that high-quality day surgery requires experienced senior anaesthetists and surgeons and that, although the day surgery unit is an ideal

**Table 2** Day surgery processes amenable to audit.

| Component of process      | Outcome measure  |
|---------------------------|--|
| Booking process           | Patients failing to attend for surgery/theatre utilisation                   |
| Pre-operative preparation | Patients cancelling on the day/failing to attend                             |
| Admission process         | Theatre start times  |
| Anaesthesia quality       | Unplanned admission rates/postoperative symptoms                             |
| Recovery                  | Discharge times/unplanned admission rates                                    |
| Discharge process         | Episodes of unplanned contact with primary care/out of hours health services |
| Postoperative follow-up   | Episodes of unplanned contact with primary care/out of hours health services |
| Audit                     | Quality and efficiency improvements  |

environment for training junior medical staff, relying on them to deliver the service results in poorer quality patient outcomes and reduced efficiency [71, 72].

There are various quality improvement projects that can be undertaken by trainees during their day surgery module, and suggestions can be found in Section 5 of the RCoA audit compendium, including audits of day surgery analgesia, PONV and unplanned admission rates. There are also audits suggested in Section 13 that examine the adequacy of training, including consultant supervision. Departments should also analyse trainee feedback from the annual GMC survey to ensure that training across all modules is of sufficient quality.

## Day surgery in special environments

A number of complex and highly specialist procedures are beginning to enter the day surgery arena [73] and the interventional radiology suite. Optimal care for these procedures should be developed by those with expertise in day surgery, working in collaboration with specialists in the management of the specific procedure. Many of these are undertaken in challenging environments. All the accepted standards for delivery of anaesthesia, assistance for the anaesthetist, monitoring and appropriate recovery facilities should be available.

## Introducing new procedures to day surgery

The successful introduction of new procedures to day surgery depends on many factors, including the procedure itself as well as anaesthetic, surgical and nursing

personnel. It is important to evaluate the procedure while still performing it as an overnight stay in order to identify any steps in the process that require modification to enable it to be performed as a day case, for example, timing of postoperative X-rays, modification of i.v. antibiotic regimens, physiotherapy input and analgesia protocols [74]. A multidisciplinary visit to another unit where the procedure is performed successfully as a day case can be very helpful. Initially limiting the procedure to a few colleagues (anaesthetists, surgeons and nurses) provides an opportunity to evaluate and optimise techniques and to implement step changes in order that the patient can be discharged safely and with optimal analgesia. Support from the community nursing team can be helpful, especially in the early stages. Once the procedure has been successfully moved to the day surgery setting, other personnel can join the team delivering care. Clear clinical protocols help to ensure that all the lessons learned during the evaluation phase are clearly passed on to colleagues.

## Isolated day surgery units

Many day surgery facilities in the UK and Ireland are isolated and the number of these is increasing. Currently, there is no set absolute minimum distance between any stand-alone unit and the nearest Emergency Department, although long distances are rare. The commissioning of any new isolated stand-alone unit requires analysis of its suitability for providing the intended services and should meet the requirements as set out in the '*Guidelines for Provision of Anaesthetic Services*'. These facilities may, or may not, be purpose-built and the clinical lead must be aware of this in managing any risk. The relationship with any nearby acute units should be reviewed regularly. Remoteness is a factor to be considered in the delivery of a safe and efficient service. Careful consideration should be given as to whether there should be at least two anaesthetists on site at any one time. Prolonged travel time may be an issue for visiting staff. On-call commitments should be taken into account in order to avoid accidents and fatigue either in the operating theatre or when travelling.

The operational policy should agree clear management of certain key issues. These include:

- 1 Appropriate patient screening and selection with availability of medical records, either in paper form or the electronic patient record
- 2 Management of medical emergencies, for example, cardiac arrest and major haemorrhage, and the availability of equipment, drugs and skilled personnel

to deal with complications while the anaesthetist is in theatre

- 3 Robust, tested communications and written service level transfer agreements between the stand-alone unit, the nearest acute hospital, its intensive care unit and the ambulance service
- 4 Management of patients who cannot be discharged home
- 5 Management of patients with complications following discharge. There should be clear information provided to patients as to where to go if complications occur
- 6 Appropriate cover until patients are discharged
- 7 Teaching, training, supervision and opportunities for research

This list is not exhaustive but gives guidance on some of the important areas that require consideration.

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## Appendix 1

Example of acute pain protocols for adult surgery.

| Pain intensity |                    | Discharge medication               | Doctors signature   |
|----------------|--------------------|------------------------------------|---------------------|
|                |                    |                                    | (sign one box only) |
| A              | None               | None                               |                     |
| B              | Mild               | Paracetamol 1 g 6 hourly           |                     |
| C              | Moderate           | Paracetamol 1 g 6 hourly           |                     |
|                |                    | Plus                               |                     |
|                |                    | Ibuprofen 400 mg 8 hourly          |                     |
| C*             | Moderate           | Paracetamol 500 g 6 hourly         |                     |
|                | (NSAID intolerant) | Codeine 30 mg 1–2 tablets 6 hourly |                     |
| D              | Severe             | Paracetamol 1 g 6 hourly           |                     |
|                |                    | Codeine 30 mg 1–2 tablets 6 hourly |                     |
|                |                    | Plus                               |                     |
|                |                    | Ibuprofen 400 mg 8 hourly          |                     |
| D*             | Severe             | Paracetamol 1 g 6 hourly           |                     |
|                | (NSAID intolerant) | Plus                               |                     |
|                |                    | Oral morphine 20 mg 6 hourly       |                     |

NSAID, non-steroidal anti-inflammatory drug, \*NSAID intolerant.

## Appendix 2

Pain categories for common procedures in the day surgery unit, to be used in conjunction with the above.

| <b>A</b>              | <b>B</b>                  | <b>C</b>                    | <b>D</b>                |
|-----------------------|---------------------------|-----------------------------|-------------------------|
| EUA ears              | Cataract surgery          | Anal surgery                | ACL reconstruction      |
| Cystoscopy            | Grommets/T tube insertion | Apicectomy of tooth         | Circumcision            |
| Restorative dentistry | Prostate biopsy           | Arthroscopy                 | Endometrial ablation    |
|                       | Sebaceous cyst surgery    | Axillary clearance          | Laparoscopy             |
|                       | Sigmoidoscopy             | Breast lumpectomy           | Haemorrhoidectomy       |
|                       | Skin lesion surgery       | Dupuytren's contracture     | Hernia repair           |
|                       | Urethral surgery          | Carpal tunnel decompression | Joint fusions/osteotomy |
|                       |                           | Cervical/vulval surgery     | Shoulder surgery        |
|                       |                           | Hysteroscopy/D&C            | Squint surgery          |
|                       |                           | Middle ear surgery          | Testicular surgery      |
|                       |                           | MUA $\pm$ steroid injection | Tonsillectomy           |
|                       |                           | Vaginal sling               | Wisdom tooth extraction |
|                       |                           | Varicose vein surgery       | Dental clearance        |
|                       |                           | Vasectomy                   |                         |
|                       |                           | Non-wisdom tooth extraction |                         |

EUA, examination under anaesthesia.